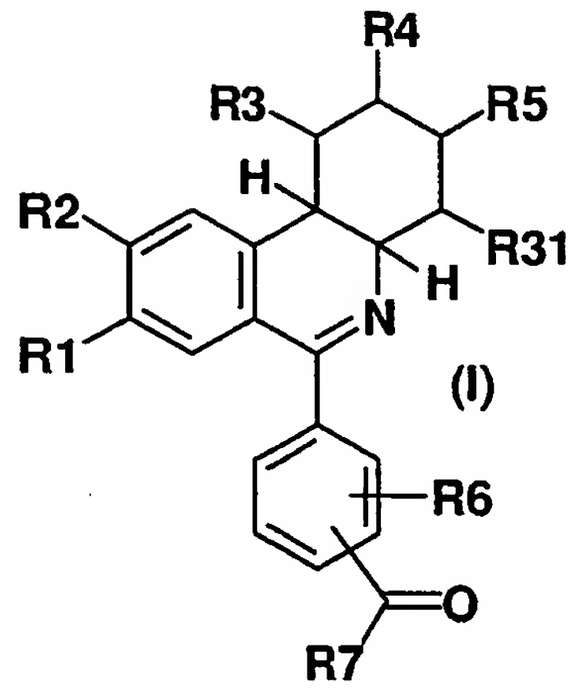
Patent Claims

1. Compounds of formula I,



in which

R1 is hydroxyl, 1-4C-alkoxy, 3-7C-cycloalkoxy, 3-7C-cycloalkylmethoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-4C-alkoxy,

R2 is hydroxyl, 1-4C-alkoxy, 3-7C-cycloalkoxy, 3-7C-cycloalkylmethoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-4C-alkoxy,

or in which

R1 and R2 together are a 1-2C-alkylenedioxy group,

R3 is hydrogen or 1-4C-alkyl,

R31 is hydrogen or 1-4C-alkyl,

either, in a first embodiment (embodiment a) according to the present invention,

R4 is -O-R41, in which

R41 is hydrogen, 1-4C-alkyl, 1-4C-alkoxy-1-4C-alkyl, hydroxy-2-4C-alkyl, 1-7C-alkylcarbonyl, or completely or predominantly fluorine-substituted 1-4C-alkyl, and

R5 is hydrogen or 1-4C-alkyl,

or, in a second embodiment (embodiment b) according to the present invention,

R4 is hydrogen or 1-4C-alkyl, and

R5 is -O-R51, in which

R51 is hydrogen, 1-4C-alkyl, 1-4C-alkoxy-1-4C-alkyl, hydroxy-2-4C-alkyl, 1-7C-alkylcarbonyl, or completely or predominantly fluorine-substituted 1-4C-alkyl,

R6 is hydrogen, halogen, 1-4C-alkyl or 1-4C-alkoxy,

either,

in a first aspect (aspect 1) according to the present invention,

R7 is -N(R8)R9, in which

R8 is hydrogen, 1-4C-alkyl or 1-4C-alkoxy-2-4C-alkyl,

R9 is hydrogen, 1-4C-alkyl, mono- or di-1-4C-alkoxy-2-4C-alkyl, hydroxy-2-4C-alkyl, mono- or di-1-4C-alkoxycarbonyl-1-4C-alkyl, Har1, pyridinyl-1-4C-alkyl, 3-7C-cycloalkyl, or 2-4C-alkyl substituted by -NR(93)R94, in which

Har1 is optionally substituted by R91 and/or R92, and is a 5- to 10-membered monocylic or fused bicyclic unsaturated heteroaryl radical comprising 1 to 4 heteroatoms selected independently from the group consisting of oxygen, nitrogen and sulfur, in which

R91 is 1-4C-alkyl or 1-4C-alkoxy,

R92 is 1-4C-alkyl or 1-4C-alkoxy,

R93 is hydrogen or 1-4C-alkyl,

R94 is hydrogen or 1-4C-alkyl,

or R93 and R94 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het1, in which

Het1 is optionally substituted by R931, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R93 and R94 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R931 is 1-4C-alkyl,

or R8 and R9 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het2, in which

Het2 is optionally substituted by R10, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R8 and R9 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R10 is 1-4C-alkyl, -C(O)R11, pyridyl, 2-4C-alkyl substituted by -NR(14)R15, or 1-4C-alkyl substituted by -C(O)N(R16)R17, in which

R11 is 1-4C-alkyl substituted by -NR(12)R13, in which

R12 is hydrogen or 1-4C-alkyl,

R13 is hydrogen or 1-4C-alkyl,

or R12 and R13 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het3, in which

Het3 is optionally substituted by R121, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R12 and R13 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R121 is 1-4C-alkyl,

R14 is hydrogen or 1-4C-alkyl,

R15 is hydrogen or 1-4C-alkyl,

or R14 and R15 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het4, in which

Het4 is optionally substituted by R141, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R14 and R15 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R141 is 1-4C-alkyl,

R16 is hydrogen, 1-4C-alkyl or pyridyl,

R17 is hydrogen or 1-4C-alkyl,

or R16 and R17 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het5, in which

Het5 is optionally substituted by R161, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R16 and R17 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R141 is 1-4C-alkyl,

or,

in a second aspect (aspect 2) according to the present invention,

R7 is -NH-N(R18)R19, in which

R18 is hydrogen,

R19 is -C(O)R20, or R21-substituted phenyl, in which

R20 is Har2, Het6, or Aryl-1-4C-alkyl, in which

Har2 is optionally substituted by R201 and/or R202, and is a 5- to 10-membered monocyclic or fused bicyclic unsaturated heteroaryl radical comprising 1 to 4 heteroatoms selected independently from the group consisting of oxygen, nitrogen and sulfur, in which

R201 is 1-4C-alkyl or 1-4C-alkoxy,

R202 is 1-4C-alkyl or 1-4C-alkoxy,

Het6 is optionally substituted by R203 and/or R204, and is a monocylic 3- to 7-membered saturated heterocyclic ring radical comprising one to three heteroatoms, each of which is selected from the group consisting of nitrogen, oxygen and sulfur, in which

R203 is 1-4C-alkyl,

R204 is 1-4C-alkyl,

Aryl is R205- and/or R206-substituted phenyl,

R205 is 1-4C-alkoxy

R206 is 1-4C-alkoxy

R21 is aminosulphonyl,

or R18 and R19 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het7, in which

Het7 is optionally substituted by R181, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R18 and R19 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R181 is 1-4C-alkyl,

and the salts, the N-oxides and the salts of the N-oxides of these compounds.

2. Compounds of formula I according to claim 1 in which

R1 is 1-2C-alkoxy, 3-5C-cycloalkoxy, 3-5C-cycloalkylmethoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-2C-alkoxy,

R2 is 1-2C-alkoxy, 3-5C-cycloalkoxy, 3-5C-cycloalkylmethoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-2C-alkoxy,

R3 is hydrogen,

R31 is hydrogen,

either, in a first embodiment (embodiment a) according to the present invention,

R4 is -O-R41, in which

R41 is hydrogen or 1-4C-alkylcarbonyl, and

R5 is hydrogen,

or, in a second embodiment (embodiment b) according to the present invention,

R4 is hydrogen, and

R5 is -O-R51, in which

R51 is hydrogen or 1-4C-alkylcarbonyl,

R6 is hydrogen,

either,

in a first aspect (aspect 1) according to the present invention,

R7 is -N(R8)R9, in which

R8 is hydrogen, 1-4C-alkyl or 1-4C-alkoxy-2-4C-alkyl,

R9 is hydrogen, 1-4C-alkyl, mono- or di-1-4C-alkoxy-2-4C-alkyl, hydroxy-2-4C-alkyl, mono- or di-1-4C-alkoxycarbonyl-1-4C-alkyl, Har1, pyridinyl-1-4C-alkyl, 3-7C-cycloalkyl, or 2-4C-alkyl substituted by -NR(93)R94, in which

Har1 is optionally substituted by R91 and/or R92, and is a 5- to 10-membered monocylic or fused bicyclic unsaturated heteroaryl radical comprising 1 to 4 heteroatoms selected independently from the group consisting of oxygen, nitrogen and sulfur, in which

R91 is 1-4C-alkyl or 1-4C-alkoxy,

R92 is 1-4C-alkyl or 1-4C-alkoxy,

R93 is hydrogen or 1-4C-alkyl,

R94 is hydrogen or 1-4C-alkyl,

or R93 and R94 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het1, in which

Het1 is optionally substituted by R931, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R93 and R94 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R931 is 1-4C-alkyl,

or R8 and R9 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het2, in which

Het2 is optionally substituted by R10, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R8 and R9 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R10 is 1-4C-alkyl, -C(O)R11, pyridyl, 2-4C-alkyl substituted by -NR(14)R15, or 1-4C-alkyl substituted by -C(O)N(R16)R17, in which

R11 is 1-4C-alkyl substituted by -NR(12)R13, in which

R12 is hydrogen or 1-4C-alkyl,

R13 is hydrogen or 1-4C-alkyl,

or R12 and R13 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het3, in which

Het3 is optionally substituted by R121, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R12 and R13 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R121 is 1-4C-alkyl,

R14 is hydrogen or 1-4C-alkyl,

R15 is hydrogen or 1-4C-alkyl,

or R14 and R15 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het4, in which

Het4 is optionally substituted by R141, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R14 and R15 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R141 is 1-4C-alkyl,

R16 is hydrogen, 1-4C-alkyl or pyridyl,

R17 is hydrogen or 1-4C-alkyl,

or R16 and R17 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het5, in which

Het5 is optionally substituted by R161, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R16 and R17 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R141 is 1-4C-alkyl,

or,

in a second aspect (aspect 2) according to the present invention,

R7 is -NH-N(R18)R19, in which

R18 is hydrogen,

R19 is -C(O)R20, or R21-substituted phenyl, in which

R20 is Har2, Het6, or Aryl-1-4C-alkyl, in which

Har2 is optionally substituted by R201 and/or R202, and is a 5- to 10-membered monocylic or fused bicyclic unsaturated heteroaryl radical comprising 1 to 4 heteroatoms selected independently from the group consisting of oxygen, nitrogen and sulfur, in which

R201 is 1-4C-alkyl or 1-4C-alkoxy,

R202 is 1-4C-alkyl or 1-4C-alkoxy,

Het6 is optionally substituted by R203 and/or R204, and is a monocylic 3- to 7-membered saturated heterocyclic ring radical comprising one to three heteroatoms, each of which is selected from the group consisting of nitrogen, oxygen and sulfur, in which

R203 is 1-4C-alkyl,

R204 is 1-4C-alkyl,

Aryl is R205- and/or R206-substituted phenyl,

R205 is 1-4C-alkoxy

R206 is 1-4C-alkoxy

R21 is aminosulphonyl,

or R18 and R19 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het7, in which

Het7 is optionally substituted by R181, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R18 and R19 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R181 is 1-4C-alkyl,

and the salts, the N-oxides and the salts of the N-oxides of these compounds.

3. Compounds of formula I according to claim 1 in which

R1 is 1-2C-alkoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-2C-alkoxy,

R2 is 1-2C-alkoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-2C-alkoxy,

R3 is hydrogen,

R31 is hydrogen,

R4 is -O-R41, in which

R41 is hydrogen or 1-4C-alkylcarbonyl,

R5 is hydrogen,

R6 is hydrogen,

either,

in a first aspect (aspect 1) according to the present invention,

R7 is -N(R8)R9, in which

R8 is hydrogen, 1-4C-alkyl or 1-4C-alkoxy-2-4C-alkyl,

R9 is hydrogen, 1-4C-alkyl, mono- or di-1-4C-alkoxy-2-4C-alkyl, hydroxy-2-4C-alkyl, mono- or di-1-4C-alkoxycarbonyl-1-4C-alkyl, Har1, pyridinyl-1-4C-alkyl, 3-7C-cycloalkyl, or 2-4C-alkyl substituted by -NR(93)R94, in which

either

Har1 is optionally substituted by R91 and/or R92, and is a 9- or 10-membered fused bicyclic unsaturated heteroaryl radical comprising 1 to 4 heteroatoms selected independently from the group consisting of oxygen, nitrogen and sulfur, in which

R91 is 1-4C-alkyl,

R92 is 1-4C-alkyl,

or

Har1 is optionally substituted by R91 and/or R92, and is a 6-membered monocyclic unsaturated heteroaryl radical comprising one or two nitrogen atoms, in which

R91 is 1-4C-alkoxy,

R92 is 1-4C-alkoxy,

R93 is hydrogen or 1-4C-alkyl,

R94 is hydrogen or 1-4C-alkyl,

or R93 and R94 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het1, in which

Het1 is optionally substituted by R931, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R93 and R94 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R931 is 1-4C-alkyl,

or R8 and R9 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het2, in which

Het2 is optionally substituted by R10, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R8 and R9 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R10 is 1-4C-alkyl, -C(O)R11, pyridyl, 2-4C-alkyl substituted by -NR(14)R15, or 1-4C-alkyl substituted by -C(O)N(R16)R17, in which

R11 is 1-4C-alkyl substituted by -NR(12)R13, in which

R12 is hydrogen or 1-4C-alkyl,

R13 is hydrogen or 1-4C-alkyl,

or R12 and R13 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het3, in which

Het3 is optionally substituted by R121, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R12 and R13 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R121 is 1-4C-alkyl,

R14 is hydrogen or 1-4C-alkyl,

R15 is hydrogen or 1-4C-alkyl,

or R14 and R15 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het4, in which

Het4 is optionally substituted by R141, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R14 and R15 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R141 is 1-4C-alkyl,

R16 is hydrogen, 1-4C-alkyl or pyridyl,

R17 is hydrogen or 1-4C-alkyl,

or R16 and R17 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het5, in which

Het5 is optionally substituted by R161, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R16 and R17 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R141 is 1-4C-alkyl,

or,

in a second aspect (aspect 2) according to the present invention,

R7 is -NH-N(R18)R19, in which

R18 is hydrogen,

R19 is -C(O)R20, or R21-substituted phenyl, in which

R20 is Har2, Het6, or Aryl-1-4C-alkyl, in which

Har2 is a 6-membered monocylic unsaturated heteroaryl radical comprising one or two nitrogen atoms,

Het6 is optionally substituted by R203 and/or R204, and is a monocylic 3- to 7-membered saturated heterocyclic ring radical comprising one to three heteroatoms, each of which is selected from the group consisting of nitrogen, oxygen and sulfur, in which

R203 is 1-4C-alkyl,

R204 is 1-4C-alkyl,

Aryl is R205- and/or R206-substituted phenyl,

R205 is 1-4C-alkoxy

R206 is 1-4C-alkoxy

R21 is aminosulphonyl,

or R18 and R19 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het7, in which

Het7 is optionally substituted by R181, and is a 3- to 7-membered saturated monocyclic heterocyclic ring radical comprising the nitrogen atom, to which R18 and R19 are bonded, and optionally one further heteroatom selected from the group consisting of oxygen, nitrogen and sulfur, in which

R181 is 1-4C-alkyl,

and the salts, the N-oxides and the salts of the N-oxides of these compounds.

4. Compounds of formula I according to claim 1 in which

R1 is 1-2C-alkoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-2C-alkoxy,

R2 is 1-2C-alkoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-2C-alkoxy,

R3 is hydrogen,

R31 is hydrogen,

R4 is -O-R41, in which

R41 is hydrogen,

R5 is hydrogen,

R6 is hydrogen,

either,

in a first aspect (aspect 1) according to the present invention,

R7 is -N(R8)R9, in which

R8 is hydrogen, 1-4C-alkyl or 1-4C-alkoxy-2-4C-alkyl,

R9 is 1-4C-alkyl, mono- or di-1-4C-alkoxy-2-4C-alkyl, hydroxy-2-4C-alkyl, mono- or di-1-2C-alkoxycarbonyl-1-4C-alkyl, Har1, pyridinyl-1-4C-alkyl, 3-5C-cycloalkyl, or 2-4C-alkyl substituted by -NR(93)R94, in which

Har1 is 2,6-dimethoxypyridinyl, quinolinyl, 2,3-dimethyl-imidazo[1,2-a]pyridinyl or [1,7]naphthyridinyl,

R93 and R94 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het1, in which

Het1 is morpholinyl,

or R8 and R9 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het2, in which

Het2 is pyrrolidinyl, morpholinyl or 4N-(R10)-piperazinyl, in which

R10 is -C(O)R11, pyridyl, 2-4C-alkyl substituted by -NR(14)R15, or 1-4C-alkyl substituted by -C(O)N(R16)R17, in which

R11 is 1-4C-alkyl substituted by -NR(12)R13, in which

R12 is 1-4C-alkyl,

R13 is 1-4C-alkyl,

or R12 and R13 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het3, in which

Het3 is morpholinyl,

R14 is 1-4C-alkyl,

R15 is 1-4C-alkyl,

or R14 and R15 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het4, in which

Het4 is morpholinyl,

R16 is 1-4C-alkyl or pyridyl,

R17 is hydrogen or 1-4C-alkyl,

or R16 and R17 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het5, in which

Het5 is pyrrolidinyl or morpholinyl,

or,

in a second aspect (aspect 2) according to the present invention,

R7 is -NH-N(R18)R19, in which

R18 is hydrogen,

R19 is -C(O)R20, or R21-substituted phenyl, in which

R20 is pyridinyl, morpholinyl, 1N-(R203)-4N-(R204)-piperazinyl, or Aryl-1-2C-alkyl, in which

R203 is 1-4C-alkyl,

R204 is 1-4C-alkyl,

Aryl is 3,4-dimethoxyphenyl,

R21 is aminosulphonyl,

or R18 and R19 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het7, in which

Het7 is morpholinyl or 4N-(R181)-piperazinyl, in which

R181 is 1-4C-alkyl,

and the salts, the N-oxides and the salts of the N-oxides of these compounds.

5. Compounds of formula I according to claim 1 in which

R1 is 1-2C-alkoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-2C-alkoxy,

R2 is 1-2C-alkoxy, 2,2-difluoroethoxy, or completely or predominantly fluorine-substituted 1-2C-alkoxy,

R3 is hydrogen,

R31 is hydrogen,

R4 is -O-R41, in which

R41 is hydrogen,

R5 is hydrogen,

R6 is hydrogen,

either,

in a first aspect (aspect 1) according to the present invention,

R7 is -N(R8)R9, in which

R8 is hydrogen, methyl, ethyl or 2-methoxyethyl,

R9 is methyl, 2-methoxyethyl, methoxycarbonylmethyl, 1,2-di-(methoxycarbonyl)-ethyl, Har1, 2-pyridinyl-ethyl, cyclopropyl, or 2-3C-alkyl substituted by -NR(93)R94, in which

Har1 is 2,6-dimethoxypyridinyl, quinolinyl, 2,3-dimethyl-imidazo[1,2-a]pyridinyl or [1,7]naphthyridinyl,

R93 and R94 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het1, in which

Het1 is morpholinyl,

or R8 and R9 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het2, in which

Het2 is pyrrolidinyl, morpholinyl or 4N-(R10)-piperazinyl, in which

R10 is pyridyl, ethyl substituted by -NR(14)R15, or methyl substituted by -C(O)N(R16)R17, in which

R14 is methyl,

R15 is methyl,

or R14 and R15 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het4, in which

Het4 is morpholinyl,

R16 is methyl or pyridyl,

R17 is hydrogen or methyl,

or R16 and R17 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het5, in which

Het5 is pyrrolidinyl or morpholinyl,

or,

in a second aspect (aspect 2) according to the present invention,

R7 is -NH-N(R18)R19, in which

R18 is hydrogen,

R19 is -C(O)R20, or R21-substituted phenyl, in which

R20 is pyridinyl, or morpholin-4-yl,

R21 is aminosulphonyl,

or R18 and R19 together and with inclusion of the nitrogen atom, to which they are attached, form a heterocyclic ring Het7, in which

Het7 is morpholinyl or 4N-(R181)-piperazinyl, in which

R181 is methyl,

and the salts, the N-oxides and the salts of the N-oxides of these compounds.

6. Compounds of formula I according to any of the preceding claims comprising one or more of the following:

one of R1 and R2 is methoxy, and the other is methoxy, ethoxy, difluoromethoxy or 2,2-difluoroethoxy, and

R3 and R31 are both hydrogen;

R4 is -O-R41, in which

R41 is hydrogen, or 1-4C-alkylcarbonyl such as e.g. acetyl, and

R5 is hydrogen; and

R6 is hydrogen;

and the salts, the N-oxides and the salts of the N-oxides of these compounds.

7. Compounds of formula I according to any of the preceding claims comprising one or more of the following:

R1 is methoxy,

R2 is methoxy, ethoxy, difluoromethoxy or 2,2-difluoroethoxy, and

R3 and R31 are both hydrogen;

R4 is -O-R41, in which

R41 is hydrogen, and

R5 is hydrogen;

R6 is hydrogen; and

-C(O)R7 is attached in the meta or para position with respect to the binding position in which the phenyl moiety is bonded to the parent molecular group,

and the salts, the N-oxides and the salts of the N-oxides of these compounds.

8. Compounds of formula I according to claim 1 in which

R1 is methoxy,

R2 is methoxy, ethoxy, 2,2-difluoroethoxy, or difluoromethoxy,

R3 is hydrogen,

R31 is hydrogen,

R4 is -O-R41, in which

R41 is hydrogen,

R5 is hydrogen,

R6 is hydrogen,

R7 is -N(R8)R9, in which

R8 is hydrogen, methyl, ethyl, or isopropyl,

R9 is methyl, ethyl, isopropyl, cyclopropyl or cyclobutyl,

whereby the radical -C(O)R7 is attached in the meta or para position with respect to the binding position in which the phenyl moiety is bonded to the parent molecular group,

the enantiomers, as well as the salts, the N-oxides and the salts of the N-oxides of these compounds and enantiomers.

9. Compounds of formula I according to claim 1 in which

R1 is methoxy,

R2 is ethoxy, 2,2-difluoroethoxy, or difluoromethoxy,

R3 is hydrogen,

R31 is hydrogen,

R4 is -O-R41, in which

R41 is hydrogen,

R5 is hydrogen,

R6 is hydrogen,

R7 is -N(R8)R9, in which

either

R8 is isopropyl, and

R9 is isopropyl,

or

R8 is hydrogen, and

R9 is cyclopropyl or cyclobutyl,

whereby the radical -C(O)R7 is attached in the meta or para position with respect to the binding position in which the phenyl moiety is bonded to the parent molecular group,

the enantiomers, as well as the salts, the N-oxides and the salts of the N-oxides of these compounds and enantiomers.

10. Compounds of formula I according to claim 1 selected from

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-(2-morpholin-4-yl-ethyl)-benzamide

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-(3-morpholin-4-yl-propyl)-benzamide

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-(4-methyl-piperazin-1-yl)-benzamide

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-morpholin-4-yl-benzamide

({1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-methanoyl}-methyl-amino)-acetic acid methyl ester

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-quinolin-3-yl-benzamide

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-(2-pyridin-2-yl-ethyl)-benzamide

1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-1-(4-pyridin-2-yl-piperazin-1-yl)-methanone

1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-1-[4-(2-morpholin-4-yl-ethyl)-piperazin-1-yl]-methanone

N-Ethyl-4-((2RS,4aRS,10bRS)-2-hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-(2-methoxy-ethyl)-benzamide

N-Cyclopropyl-4-((2RS,4aRS,10bRS)-2-hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide

2-(4-{1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-methanoyl}-piperazin-1-yl)-1-pyrrolidin-1-yl-ethanone

2-(4-{1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-methanoyl}-piperazin-1-yl)-N-pyridin-3-yl-acetamide

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N,N-dimethyl-benzamide

2-(4-{1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-methanoyl}-piperazin-1-yl)-N-pyridin-2-yl-acetamide

2-(4-{1-[4-((2R,4aR,10bR)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-methanoyl}-piperazin-1-yl)-N,N-dimethyl-acetamide

2-(4-{1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-methanoyl}-piperazin-1-yl)-1-morpholin-4-yl-ethanone

1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-1-(4-pyridin-4-yl-piperazin-1-yl)-methanone

1-[4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-phenyl]-1-morpholin-4-yl-methanone

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-(2-pyridin-4-yl-ethyl)-benzamide

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N-(2-pyridin-3-yl-ethyl)-benzamide

4-((2RS,4aRS,10bRS)-2-Hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzoic acid N'-(1-morpholin-4-yl-methanoyl)-hydrazide

N-(2,6-Dimethoxy-pyridin-3-yl)-4-((2RS,4aRS,10bRS)-2-hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide

4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-N,N-dimethyl-benzamide

N-Cyclopropyl-4-[(2RS,4aRS,10bRS)-9-(1,1-difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-benzamide

4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-N,N-bis-(2-methoxy-ethyl)-benzamide

4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-N-(2-morpholin-4-yl-ethyl)-benzamide

4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-N-(3-morpholin-4-yl-propyl)-benzamide

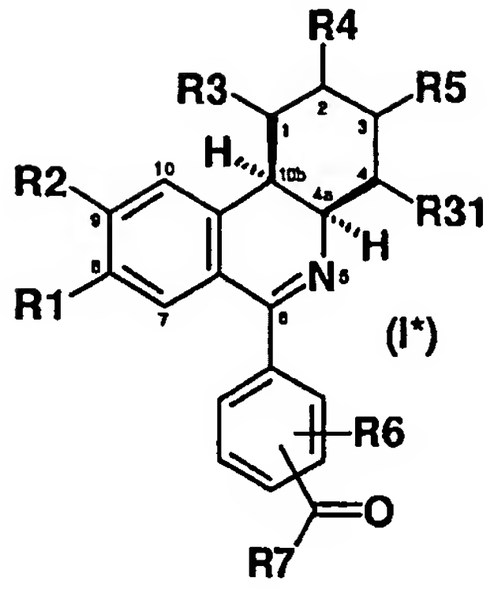
1-{4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-phenyl}-1-[4-(2-morpholin-4-yl-ethyl)-piperazin-1-yl]-methanone

1-{4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-phenyl}-1-(4-pyridin-4-yl-piperazin-1-yl)-methanone

2-[4-(1-{4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-phenyl}-methanoyl)-piperazin-1-yl]-N-pyridin-2-yl-acetamide

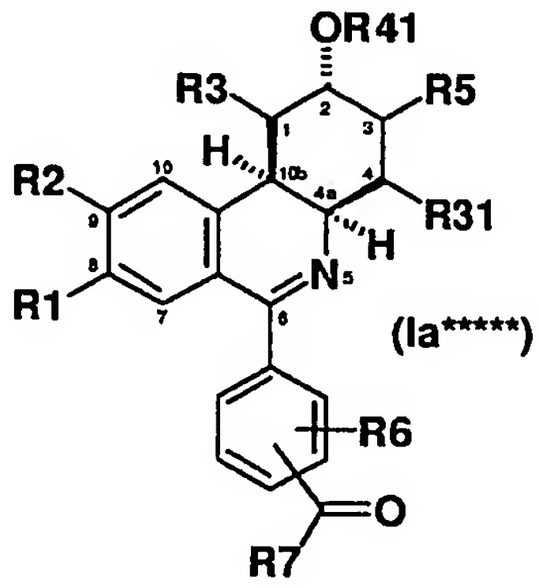
2-[4-(1-{4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-phenyl}-methanoyl)-piperazin-1-yl]-1-morpholin-4-yl-ethanone
1-{4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-phenyl}-1-pyrrolidin-1-yl-methanone
2-[4-(1-{4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-phenyl}-methanoyl)-piperazin-1-yl]-N,N-dimethyl-acetamide
1-{4-[(2RS,4aRS,10bRS)-9-(1,1-Difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-phenyl}-1-[4-(2-dimethylamino-ethyl)-piperazin-1-yl]-methanone
N-(2,6-Dimethoxy-pyridin-3-yl)-4-((2R,4aR,10bR)-2-hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide
N-(2,6-Dimethoxy-pyridin-3-yl)-4-((2S,4aS,10bS)-2-hydroxy-8,9-dimethoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide
N-Cyclopropyl-4-[(2R,4aR,10bR)-9-(1,1-difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-benzamide
N-Cyclopropyl-4-[(2S,4aS,10bS)-9-(1,1-difluoro-methoxy)-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl]-benzamide
N-Cyclopropyl-4-((2R,4aR,10bR)-9-ethoxy-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide
N-Cyclobutyl-4-((2R,4aR,10bR)-9-ethoxy-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide
4-((2R,4aR,10bR)-9-Ethoxy-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N,N-diisopropyl-benzamide
N-Cyclopropyl-3-((2R,4aR,10bR)-9-ethoxy-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide
N-Cyclobutyl-3-((2R,4aR,10bR)-9-ethoxy-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide
3-((2R,4aR,10bR)-9-Ethoxy-2-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-N,N-diisopropyl-benzamide and
N-Cyclopropyl-4-((3S,4aR,10bR)-9-ethoxy-3-hydroxy-8-methoxy-1,2,3,4,4a,10b-hexahydro-phenanthridin-6-yl)-benzamide,
the enantiomers, as well as the salts, the N-oxides and the salts of the N-oxides of these compounds and enantiomers.

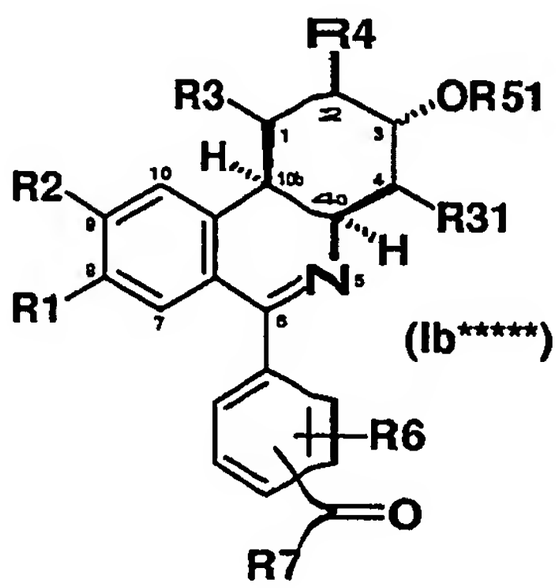
11. Compounds of formula I according to any of the preceding claims, which have with respect to the positions 4a and 10b the configuration shown in formula I*:



and the salts, the N-oxides and the salts of the N-oxides of these compounds .

12. Compounds of formula I according to any of the preceding claims, which have with respect to the positions 2, 4a and 10b the configuration shown in formula Ia*****, or, which have with respect to the positions 3, 4a and 10b the config shown in formula Ib*****:





and the salts, the N-oxides and the salts of the N-oxides of these compounds .

13. Compounds of formula I as claimed in claim 1 for use in the treatment of diseases.

14. A pharmaceutical composition comprising one or more compounds of formula I as claimed in claim 1 together with customary pharmaceutical excipients and/or vehicles.

15. The use of compounds of formula I as claimed in claim 1 for the production of pharmaceutical compositions for treating respiratory disorders.

16. The use of compounds of formula I as claimed in claim 1 for the production of pharmaceutical compositions for treating PDE-mediated disorders.

17. A method for treating illnesses in a patient comprising administering to said patient a therapeutically effective amount of a compound of formula I as claimed in claim 1.

18. A method for treating airway disorders in a patient comprising administering to said patient a therapeutically effective amount of a compound of formula I as claimed in claim 1.